

**Strategies, models and
technologies of economic
systems management in the
context of international
economic integration**

**Collective monograph
edited by Dr.oec. Prof. Maksym Bezpartochnyi,
Dr.oec. Prof. Viktoriia Riashchenko,
Dr.paed. Nina Linde**

Institute of Economics of the Latvian
Academy of Sciences (Riga, Latvia) 2020

Strategies, models and technologies of economic systems management in the context of international economic integration: collective monograph / edited by Dr.oec. Prof. Maksym Bezpartochnyi, Dr.oec. Prof. Viktoriia Riashchenko, Dr.paed. Nina Linde. – Riga: Institute of Economics of the Latvian Academy of Sciences, 2020. – 296 p.

The authors of the book have come to the conclusion that to improve the efficiency of managing economic systems it is necessary to use modern strategies, models and technologies. Basic research focuses on assessment of intellectual capital, economic security, social sustainability in tourism, the impact of the COVID-19 pandemic on different sectors of the economy. The research results have been implemented in the different models of controlling, management methodology, personnel management, and strategies for the efficient use of financial resources, development of transport logistics, a creative economy and the creation of startups. The results of the study can be used in decision-making at the level of international business, ministries and departments that regulate the processes development of economic systems, ensuring stability and efficiency. The results can also be used by students and young scientists in developing of strategies, models and technologies for economic systems management in the context of international economic integration.

Reviewers (international scientific editorial board):

Aivars Stankevičs – *Professor, Dr.oec. Chairman of the ISMA Senate, Vice-rector for administrative work ISMA University, Riga, Latvia*

Remigijus Kinderis – *PhD, Director Deputy for Strategic Development, Academic Council Chairman, Klaipeda State University of Applied Sciences, Klaipeda, Lithuania*

The collective monograph is approved for publication at the meeting of the Scientific Board of the Institute of Economics of the Latvian Academy of Sciences of 23th January 2020, *Minutes No. 2020/1.*

Reproduction or citation reference is mandatory.

© Institute of Economics of the Latvian Academy of Sciences, 2020

ISBN 978-9984-774-27-5 (print)

ISBN 978-9984-774-28-2 (PDF)

INTRODUCTION	7
Chapter 1	
SCIENTIFIC FOUNDATIONS AND MODELS OF ECONOMIC SYSTEMS MANAGEMENT	8
Čiderová D., Kovačević D.	
BREXIT: Britain's TRUMP card or (hi)story of BRitish compLEXITy?	8
Doronin A.	
Prerequisites of updating management methodology	30
Jamagidze L.	
Policy responses to trade shocks in the time of pandemic	36
Melnyk O., Horbal N., Zaliska L., Tiagnyriadko I.	
Circular economy model adoption for waste management in Ukraine: European experience	44
Nikitina A., Velychko K., Kozub V.	
Theoretical aspects of controlling as a component of an effective system of management of enterprises in the globalization conditions	53
Chapter 2	
RESOURCE ENSURING IN THE ECONOMIC SYSTEMS MANAGEMENT	62
Dudnyk E., Minenko S., Cherviakov D.	
Human resources as a fundamental basis of enterprise personnel management	62

Ivashkiv I., Korol S., Klochan V., Klochan I.	
Features of formation and directions of use the financial resources of insurance companies in Ukraine: theoretical aspect	76
Kuranovic V.	
History, development, revolution, trends and new technologies in China transport logistics distribution era	88
Riashchenko V., Plota S., Lapaine T., Bezpartochna O.	
The system of links between education and culture and their impact on the economic and social development of society	100
Shcherbachenko V., Zakharkin O., Smolennikov D.	
State support and regulation of intellectual capital development	109
Chapter 3	
INNOVATION AND MODERN TECHNOLOGIES IN THE ECONOMIC SYSTEMS MANAGEMENT	118
Andriushchenko K., Kondarevych V.	
Modern fundamentals of the conceptual model of digitalization of business processes of enterprises	118
Andryeyeva N., Tiutiunnyk H., Martyniuk O.	
Recommendations concerning the support system creation of ecologization the investment-innovation policy of Ukraine	130
Baculakova K.	
Creative economy as a driving force of the sustainable economic system	139
Morozov V., Mezentseva O., Proskurin M.	
Building development models for the product of start-up projects based on game theory	149
Tereshchenko T.	
Integrated assessment of insurance market safety as an economic system taking into account the degree influence of each indicator	159

Shcherbachenko Viktoriia

*PhD in Economics, Senior Lecturer of
International Economic Relations
Department*

Zakharkin Oleksii

*Doctor of Economic Sciences
Professor, Associate Professor of
Department of Finance and
Entrepreneurship*

Smolennikov Denys

*PhD in Economics, Associate Professor
of Management Department
Sumy State University
(Sumy, Ukraine)*

**STATE SUPPORT
AND REGULATION
OF INTELLECTUAL
CAPITAL
DEVELOPMENT**

The state has a significant opportunity to influence the development and accumulation of intellectual capital, which in turn is a driver of innovation, economic growth and ensuring its competitive advantage in the face of global challenges. According to the website of the Government Portal of the Cabinet of Ministers of Ukraine, the reform of education, health care and pension reform (Government Portal) should be aimed at the development of human capital in Ukraine. Intellectual capital is formed through investment in people, which includes the cost of education, training, health care costs, and so on. The presence of a substantial intellectual capital is one of the main and defining competitive advantages that ensures stable development of the enterprise and consolidation of its positions in the market at the expense of increasing competitiveness, since effective use of intellectual capital enhances other competitive advantages and promotes the formation of new ones (Shcherbachenko, 2016).

The company must provide prospective employees with appropriate training or measures to improve their skills, and this should be seen not as an educational cost, but as an investment in personnel capital (Inozemtsev, 1998). C. McConnell and S. Bryu (McConnell, Bryu, 2009) have considered investment in personnel capital as any action that enhances qualifications and abilities and thereby labor productivity of workers. In turn, J. Galbraith (Galbraith, 1969) emphasized that a dollar

invested in human intelligence often brings a greater increase in national income than a dollar invested in railroads, dams, machines and other capital gains. Education becomes high-performance form of capital investments.

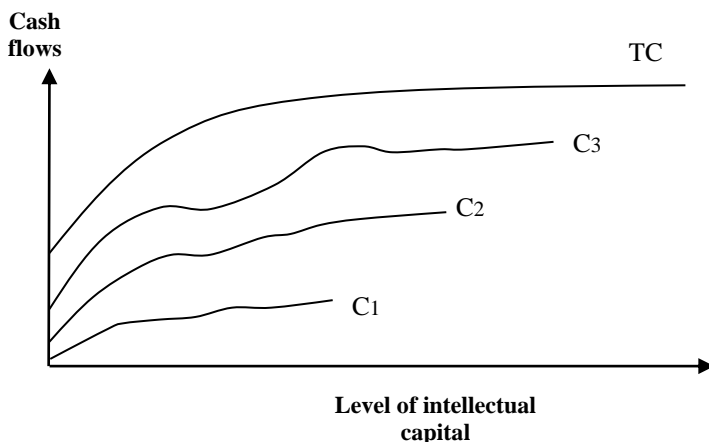
Carriers of intellectual capital can be considered as professionals, endowed with unique and difficult-to-be-replaced abilities, the importance of which for society is best evaluated in terms of the market. It should be noted that the intellectual capital as an economic category can exist only in the market economy, as well as other forms of capital, since the ability to work is a commodity that brings not only the cost, but also the added value. The market pays for what value is endowed.

Intellectual capital is connected with qualitative characteristics of the labor force, such as natural features (health, psychophysiological stability, etc.); appropriate education, which give individual the opportunity and desire to be anxiously engaged, disciplined labor, systematically work on themselves; professional training, qualification level combined with unwavering work on its increase, search for new solutions, constant increase of cultural level that allows to expand the horizon of knowledge and thinking (Shcherbachenko, 2016).

The objects of formation of enterprise intellectual capital are personnel, informational, organizational and client capitals. The existence of the enterprise in the market is not possible without them. Formation of intellectual capital is due to the use of state budget funds allocated for education and R&D, as well as on healthcare protection of the population of the country; income of individual citizens, who invest money in their own development (training, advanced training, active recreation, sports, travel, etc.); investments of enterprises on formation and development of personnel, organizational, client and information capital; and also at the expense of grants of international and domestic private funds that are interested in the development of science, technology, society, preserving the environment. It should be noted that all interested parties participate in the formation of the intellectual capital of the enterprise: management of the enterprise, employees, consumers, mediators, financial and credit institutions, insurance companies, the state, foreign investors etc. (Figure 2.2).

Areas of intellectual capital formation are the R&D, conducted by the enterprise or research institutions, the results of which can be implemented in the production-marketing activities of subjects of economic activity; The system of education and health has a direct impact on the formation of intellectual capital of the population,

economically active population of the country forms personnel capital of individual enterprises. Public institutions that define the directions of the development of society exert influence on the processes of using and reproduction of intellectual capital. Technology transfer allows them to make technology available to a wide range of users, this in turn contributes to the further use and reproduction of technology, as well as the creation of new products, processes, materials or services.



Note. C1 – Costs of employees to increase level of knowledge and skills; C2 – Expenses of the enterprise; C3 – External stakeholder funds; TC – Total costs

Figure 2.2 Dependence between the costs of formation and level of intellectual capital (Shcherbachenko, 2016)

The factors that determine the effectiveness of the formation of intellectual capital should include the effectiveness of state regulation in the field of science, education, social protection, economic development, environmental preservation, etc.; quality of management of individual enterprises, their mission and goals; level of investment in innovative projects and other spheres of intellectual capital formation; level of activity and internal motivation of employees, their interest in own development and achievement of goals of the enterprise in general.

The process of formation and development of intellectual capital is impossible without its financing. Employees finance the development of their own intellectual capital at the expense of wages, bonuses, other

current income, savings. They invest funds in their own education, health, recreation, living conditions. The funds of the company include profit, depreciation charges, released tangible assets. Investment of external stakeholders includes funds from state and local budgets allocated for current financing, state targeted programs, execution of state orders; extra-budgetary funds: credits, external investments, means of the customer of intellectual products, funds of venture funds and insurance companies.

Figure 2.3 demonstrates the dependence between the costs of formation and reproduction of intellectual capital, which can be initiated by different stakeholders, and profit that the company receives from the use of its intellectual capital.

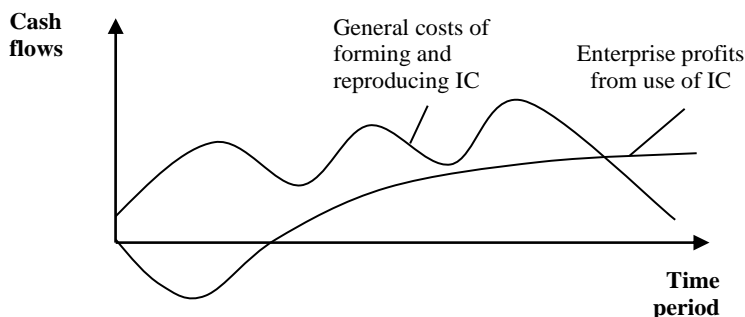


Figure 2.3 Return on investment in intellectual capital (Scherbachenko, 2016)

The spending curve has a wavy appearance because investments in the formation of intellectual capital can grow or decrease in different periods of time, depending on the need for them. For example, the enterprise spent a certain amount of money in the current year for purchase of new technology, but it takes time for its development and production. There may be costs associated with the preparation of employees for its use. The profit at this point in time can be negative, but later the company will get the return on the use of new, modern production technology that will reduce other costs associated with the production of products, and help increase the level of profits and the formation of a sustainable competitive advantage.

The company must periodically update its intellectual assets and technical support of the production process to maintain the desired level

of profitability. High level of intellectual capital is provided by the enterprise super profit (profitability above average). In a certain period of time (the point of intersection of costs and profits in Figure 2.3) profits will provide intelligent assets created in the previous periods of time, and the costs of maintaining intellectual capital will decrease (Shcherbachenko, 2016).

Ukraine needs significant changes to preserve the country's existing intellectual capital. According to the date of UNDP it is at 88 places in terms of human development in the world. The Human Development Index is 0.751 (Human development reports). Taking into consideration the tendency to reduce the comparative factor of efficiency of using the intellectual capital of Ukraine during 2011 – 2017. (Derevyanko, 2019), the state requires the adoption of measures for the preservation, development, accumulation and efficient use of goods and services.

Considering this, one of the important tasks is finding effective levers of state regulation and stimulation of accumulation of intellectual capital and its use in innovation, among them (Wakim, 2017):

a) conceptual apparatus might be elaborated in detail dynamic and flexible, adequate changes occurring in the economy, and the differentiation of types of innovation activity depending on the industry, in which it is integrated;

b) the legislatively enshrined state innovation policy and the legal mechanism of its provision;

c) basis for the application of state support for innovations are formal and do not depend on the will of the state, but certain caveats must be envisaged.

The following the instruments of state stimulation of innovation activities applied by developed countries are (Wakim, 2017):

1) state guarantees, such as target state investments, risk insurance for innovative enterprises, social insurance of employees involved in innovation;

2) application of special tax, customs and depreciation benefits;

3) economic measures of state support applied in the field of innovation (state crediting, subsidies, leasing of equipment and equipment necessary for innovation, etc.);

4) activities of organizational nature (state planning, creation of special programs for the development of innovative enterprises, thematic fairs and other events, encouragement of young specialists);

5) stimulating cooperation of industrial corporations in the sphere of scientific researches, cooperation of the universities and research

institutes with industrial sector.

To assess the innovative development of the country there are such international ratings as (Mazaraki, 2019, p. 18):

- Intellectual Property Right Index;
- Global Innovation Index;
- Bloomberg Innovation Index;
- Global Competitiveness Index;
- Innovation Union Scoreboard;
- Global Talent Competitiveness Index.

Table 2.6

Innovative economies in the world, divided into income groups, 2019 (Compiled by author: Dutta, Lanvin, Wunsch-Vincent, 2019, p. 17)

High-income countries	Upper middle-income countries	Lower middle-income countries	Low-income countries
1. Switzerland	1. China	1. Vietnam	1. Rwanda
2. Sweden	2. Malaysia	2. Ukraine	2. Senegal
3. USA	3. Bulgaria	3. Georgia	3. Tanzania

According to the published report on the Global Innovation Index (Dutta, Lanvin, Wunsch-Vincent, 2019, p. 17), Ukraine ranked second in the group of lower middle-income countries behind Vietnam (Table 2.6).

Innovation Union Scoreboard for Ukraine is amounted to 25, according to data 2018. It is the lowest among the researched countries (Innovation Union Scoreboard, 2019).

To the deterrent development of innovations in the state, we can include a high level of social tensions and low living standards of most of the population, high level of corruption, armed conflict in the east of Ukraine, internal political conflicts, the need for fundamental reforms in the country, external objective circumstances – the consequences of the global financial crisis, the weakness of the economic system in the era of reorientation of postindustrial development.

Priority vectors of innovation development, identified in the pre-crisis period in accordance with the Law of Ukraine “On priority directions of innovative activity in Ukraine” for 2011-2021 years are (Zakharkina, 2018; Law of Ukraine):

- 1) mastering of new technologies of energy transportation, introduction of energy-efficient, resource-saving technologies, development of alternative energy sources;

Table 2.7

The position of Ukraine in the international ratings for the evaluation of innovation activity in 2019 (compiled by the author)

Rating	Ukraine's position among the total number of countries that be analyzed
Intellectual Property Right Index	109/129 (International Property Rights Index, 2019)
Global Innovation Index	47/129 (Dutta, Lanvin, Wunsch-Vincent, 2019, p. 337)
Bloomberg Innovation Index	56/ 60 (New Time, 2020)
Global Competitiveness Index	85/141 (Schwab, 2019, p. 573)
Global Talent Competitiveness Index	63/125 (Lanvin, Monteiro, 2019, p. 206)

2) mastering of new technologies of high-tech development of transport system, rocket and space industry, aircraft and shipbuilding, armament and military equipment;

3) mastering of new technologies of materials production, their processing and connection, creation of the industry of nanomaterials and nanotechnologies;

4) technological renewal and development of the agro-industrial complex;

5) introduction of new technologies and equipment for quality medical care, treatment, pharmaceuticals;

6) the widespread use of technology cleaner manufacturing and environmental protection;

7) development of modern information, communication technologies, robotics.

Let consider the main sources of risks that influence or may influence the change of vectors of innovative development in Ukraine:

- 1) lack of strong state and public institutions;
- 2) macroeconomic instability;
- 3) weak infrastructure;
- 4) the level of health care and disease prevention;
- 5) rising unemployment;
- 6) vulnerability of the financial system;
- 7) the dynamics of the business environment;
- 8) low capacity to innovate.

Funding for some of Ukraine's priority areas for innovation is under threat due to the spread of the pandemic and the global economic crisis. Significant state budget funds were redirected to provide measures to

combat the coronavirus. Such areas as, for example, the development of new technologies for high-tech development of the transport system, rocket and space industry, aerospace, armaments and military equipment or the development of new technologies for materials production, processing and connection, the creation of nanomaterials and nanotechnologies require significant financial support from the state.

However, funding for the introduction and development of new technologies and equipment for quality medical care, treatment, pharmaceuticals, including the production of COVID-19 vaccine, has increased.

Thus, today Ukraine is in a rather difficult situation, when the development of innovation is in an unsatisfactory situation. This is due to the national state of the economy and the global challenges we have had to face since the beginning of 2020. To stabilize the situation, it is necessary to find new sources of funding for innovative projects and adapt them to the requirements of the modern world.

Acknowledgement

This work was supported by the Ministry of Education and Science of Ukraine (Project No. 0117U003922 “Innovative drivers of national economic security: structural modeling and forecasting”).

References:

1. Wakim V.E. (2017). *Stimulation of innovative activity: comparative legal aspect. Economic theory and law. Commercial law*, 2 (29), p. 134 - 145. [in Ukrainian].
2. Galbraith, J.K. (1969). *New industrial society*. Moscow, Progress, 480 p. [in Russian].
3. Derevyanko V.M. (2019). *Intellectual capital as a factor in the development of the national economy: PhD thesis: 08.00.03. Irpin*, 285 p. [in Ukrainian].
4. Inozemtsev V.L. (1998). *Outside of an economic society*. Moscow, Academia. Science, 640 p. [in Russian].
5. McConnell C., Bru S. (2009). *Economics. INFRA-M*, 944 p. [in Russian].
6. *Human capital development. Government portal*. URL: <https://www.kmu.gov.ua/diyalnist/reformi/rozwitok-lyudskogo-kapitalu> (25.05.2020)
7. Shcherbachenko V.O. (2016). *Organizational and economic mechanism of intellectual capital management of the enterprise. The mechanism of economic regulation. №1*, p. 123-130. [in Ukrainian].

8. Shcherbachenko V.O. (2016). *Economic principles of management of the intellectual capital of the enterprise in the conditions of global competition: PhD thesis: 08.00.04. Sumy, 205 p.* [in Ukrainian].
9. *Human development reports. Ukraine. United Nations Development Program.* URL: <http://hdr.undp.org/en/countries/profiles/UKR> (25.05.2020).
10. Dutta S., Lanvin B., Wunsch-Vincent S. (2019). *Global Innovation Index 2019. 12th Edition. Cornell University, INSEAD, and the World Intellectual Property Organization, 151 p.* URL: <https://www.globalinnovationindex.org/gii-2019-report> (25.05.2020).
11. Verkhovna Rada of Ukraine. *About priority directions of innovative activity in Ukraine. Law of Ukraine from 08.09.2011 № 3715-VI.* URL: <http://zakon.rada.gov.ua/laws/show/3715-17> (25.05.2020). [in Ukrainian].
12. Zakharkina L.S. (2018). *Innovative drivers of national economic security: structural modeling and forecasting: structural modeling of vectors of innovative development of economic entities of Ukraine: report on R&D (intermediate). Sumy: Sumy State University, 132 p.* [in Ukrainian].
13. Mazaraki A.A. (2019). *Problems and prospects for the development of innovation in Ukraine: materials of the XII International Business Forum (Kyiv, March 22, 2019). Kyiv National Trade and Economy University, 154 p.* [in Ukrainian].
14. Hollanders H., Es-Sadki N., Merkelbach I. *The European Innovation Scoreboard report. Luxembourg: Publications. Office of the European Union, 2019. 95 p.* URL: <https://www.globalinnovationindex.org/gii-2019-report> (25.05.2020).
15. *Bloomberg Innovation Economy Rankings. New time, 2020.* URL: <https://nv.ua/biz/economics/ukraina-zanyala-56-mesto-v-reytinge-innovacionnyh-ekonomik-bloomberg-2020-novosti-ukrainy-50065103.html> (25.05.2020). [in Ukrainian].
16. Lanvin B., Monteiro F. (2019). *The Global Talent Competitiveness Index, INSEAD, the Adecco Group, and Tata Communications. 338 p.* URL: <https://gtcistudy.com/wp-content/uploads/2019/01/GTCI-2019-Report.pdf> (25.05.2020).
17. Schwab K. (2019). *The Global Competitiveness Report. World Economic Forum, 666 p.* URL: http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf (25.05.2020).
18. *International Property Rights Index 2019.* URL: <https://www.internationalpropertyrightsindex.org/> (25.05.2020).
19. *Innovation Union Scoreboard 2019.* URL: <https://ec.europa.eu/docsroom/documents/35916> (25.05.2020).